59th Annual Scientific Conference • AAAM

Association for the Advancement of Automotive Medicine

Phone: 847-844-3880
35 E. Wacker Drive, Suite 850, Chicago, IL 60601
Email: info@aaam.org
www.aaam.org

October 3-7, 2015 • Philadelphia

PROGRAM
Objectives
Participants of this Program will:

Assess published and active research in multidisciplinary approaches to automotive-related trauma in areas such as epidemiology, biomechanics, treatment and management, transport, psychology, accidentology, and human factors. Review injuries and injury mechanisms, human tolerance as related to vehicular injury, restraint systems effects, crashworthiness and risk analysis. Effectively treat and prevent injuries stemming from an automotive environment.

Attendance
Who Should Attend:

This program is intended for emergency physicians and nurses, orthopedic surgeons, trauma surgeons, neurosurgeons, radiologists, physiatrists, urologists, emergency medical personnel, biomechanics and vehicle design engineers, automotive engineers, crash investigators, health policy specialists, internists, psychologists, epidemiologists, other human factor specialists, accident reconstructionists and road safety experts as well as and other clinicians and allied health professionals, representatives from the insurance industry and automotive engineering professionals.

Social Program
Welcome Reception:
Our welcome reception will be held at the Loews Philadelphia Hotel.

Recognition Dinner:
The traditional recognition dinner and awards ceremony will be held at:

The National Constitution Center
The first and only institution in America established by Congress to “disseminate information about the United States Constitution on a non-partisan basis in order to increase the awareness and understanding of the Constitution among the American people.”

Venue
Official Conference Venue:
Loews Philadelphia Hotel
1200 Market Street
Philadelphia, PA 19107
PRE-CONFERENCE SEMINAR
Epidemiologic and Outcome Research in Automotive Medicine: a primer for non-epidemiologists
8:30 AM - 4:30 PM
All delegates are welcome.
Space is Limited: PRE-REGISTRATION IS REQUIRED.

Objectives
- To familiarize non-epidemiologists involved in automotive medicine with key concepts and methodological principles used in epidemiologic and outcome research in automotive medicine;
- To promote critical reading of published articles in automotive medicine, to help differentiate the quality of evidence;
- To promote non-epidemiologists exchanges with epidemiologists and facilitate their involvement and/or support in conducting epidemiologic studies.

Content
- What questions can be addressed by epidemiologic and outcome research?
- What study designs can answer these questions?
- What are the issues in selecting data sources and study subjects?
- What issues are there in measuring exposures and outcome?
- What are the issues in following up subjects and measuring outcomes?
- How to interpret results of epidemiologic and outcome research?

Faculty
Prof Rachid Salmi, INSERM U-897 Injury epidemiology and control team, School of Public Health, University of Bordeaux (France)

Prof Mark Stevenson, Prof of Urban Transport and Public Health, University of Melbourne, (Australia)
Student Symposium
8:30 AM - 4:30 PM
This special day features works in progress presented by young researchers.

8:30  - WELCOME -
Jason Forman, PhD—Symposium Organizer
Francisco Lopez-Valdes, PhD—Co-organizer

8:45  Development of a Rollover Dummy: Initial Design/Modification Evaluation with the MADYMO THOR Dummy
Qi Zhang, PhD candidate, University of Virginia, Center for Applied Biomechanics, Charlottesville, VA

9:05  Development of a Compact Coplanar ‘6aw’ Sensor Array for Accurate Measurement of Head Kinematics
Samuel D. Goldman, Graduate Student, Injury Biomechanics Research Center at The Ohio State University, Columbus, OH

9:25  Development and Validation of an Atlas-Based Finite Element Brain Model
Logan E. Miller, PhD Candidate, Virginia Tech-Wake Forest Center for Injury Biomechanics, Winston-Salem, NC

9:45  Vertical Coupling in the Thorax Side Impact Response
Felix Möhler, MS, Karlsruhe Institute of Technology, Karlsruhe, Germany

10:05 Comparison of Structure-based Scaling and Mass-Based Scaling Methods Using PMHS Test Data
Taotao Wu, PhD candidate, Center for Applied Biomechanics, University of Virginia, Charlottesville, VA

10:25 The Relationship between Geometric and Structural Properties of Human Ribs: Implications for Fracture Risk
Michelle M. Murach, BS Biomedical Engineering, Injury Biomechanics Research Center at The Ohio State University, Columbus, OH

10:45  - BREAK -

11:00 Understanding Head Injury Mechanisms: Parametric Modeling of Head/Neck Response
Derek A. Jones, MS Student, Wake Forest University, Winston-Salem, NC

11:20 Automated Detection of Lane Departure Events in Naturalistic Driving Data
Max Bareiss, Mechnical Engineering, Rowan University, Glassboro, NJ

11:40 Effects of the 2011 Maryland Alcohol Tax Increase on Fatal Alcohol-Related Motor Vehicle Injuries
Marie-Claude Lavoie, PhD candidate, University of Maryland, Baltimore, MD

12:00 License Sanctions, One Size Fits All or Time for Review?
Belinda Clark, PhD candidate, Monash University Accident Research Centre, Melbourne, Australia

12:20 Biofidelity Assessment of a First Generation Obese Dummy
Hamed Joodaki, PhD candidate, University of Virginia, Charlottesville, VA

12:40  - LUNCH -

1:40 The Potential for Intersection Advanced Driver Assistance System to Reduce Straight Crossing Path Crashes
Kerry I. Page, Mechanical Engineering, Virginia Tech, Biomedical Engineering and Mechanics Department, Blacksburg, VA

2:00 Texting While Driving: Validation of a New Driver-reported Measure and Anonymous National Study
Emily Gliklich, student general studies, The Winsor School, Boston, MA
2:20 Microstructure of Cancellous Bone as a Strength Predictor for a Wide Range of Strain Rates
Marianne Prot, PhD candidate, LBM/Institut de Biomecanique Humaine Georges Charpak, Paris, France

2:40 Characterization of the Occult Nature of Injury for Frequently Occurring Motor Vehicle Crash Injuries
Samantha L. Schoell, PhD candidate, Center for Injury Biomechanics, Virginia Tech-Wake Forest University, School of Biomedical Engineering and Sciences, Winston-Salem, NC

3:00 Methodology for Validating Motion Computer Simulation with Experimental 3-D Motion Capture
Ana I. Lorente, PhD candidate, Institute of Engineering Research, University of Zaragoza, Spain

3:20 Thoracolumbar Spine Injuries: What is causing them?
Rocio Suarez del Fuego, PhD candidate, University of Zaragoza, Spain

3:40 The Effect of Pre-Crash Velocity Reduction on Occupant Response Using a Human Body Finite Element Model
Berkan Guleyupoglu, PhD candidate, Wake Forest University, Winston-Salem, NC

4:00 - ADJOURN -

4:15—6:00—MENTORING SESSION - John Bolte, PhD—Organizer
After yet another successful event last year, AAAM will continue to offer the speed mentoring session. This lively interactive session allows students and young professionals to interact with more experienced, distinguished AAAM members. Based on a speed dating model, this event offers a tremendous opportunity for networking and shared learning in an interesting and innovative setting.

WELCOME RECEPTION
6:30 PM
Preceding the formal opening of the conference, AAAM invites all attendees to enjoy an evening with friends and colleagues. The reception will be held at The Loews Philadelphia Hotel, our venue for the conference.
### Monday

**October 5**

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| 8:00  | WELCOME ADDRESS | Frank Pintar, PhD  
Matthew Maltese, PhD  
*AAAM President*  
*Scientific Program Chair* |                                                                                                              |
| 8:15  | KEYNOTE ADDRESS | Flaura Koplin Winston, MD, PhD  
Children’s Hospital of Philadelphia |                                                                                                              |
| 8:00  | CHILD RESTRAINT SYSTEM PERFORMANCE AND USE |  
**Moderator:** Jessica Jermakian, DSc  
9:00 Quantifying Child Restraint System (CRS) Compatibility in the Vehicle Seat Environment  
Julie Bing, MS, The Ohio State University, Columbus, OH.  
*CoAuthors:* John Bolte and Amanda Agnew  
9:20 The Influence of Enhanced Side Impact Protection on Kinematics and Injury Measures of Far and Center-Seated Children in Forward Facing Child Restraints  
Hans Hauschild, MS, Medical College of Wisconsin, Milwaukee, WI.  
*CoAuthors:* John Humm, Narayan Yogananadan, Frank Pintar, Bruce Kaufman Matthew Maltese, and Kristy Arbogast  
9:40 Effects of LATCH versus Available Seatbelt Installation of Rear Facing Child Restraint Systems on Head Injury Criteria for 6 Month Old Infants in Rear End Collisions  
Jamie R. Williams, PhD, Robson Forensics Inc., Lancaster, PA.  
*CoAuthors:* Carrie O’Donel and Peter Leiss |                                                                                                              |
| 11:20 | Children’s and Adults’ Comfort  
Experience of Extra Seat Belts During Ride in the Rear Seat of a Passenger Car | Anna-Lisa Osvalder, PhD, Chalmers University of Technology, Gothenburg, Sweden.  
*CoAuthors:* Ida Hansson, Katarina Bohman |                                                                                                              |
| 11:40 | Dynamic Strength of Top Tether Anchorages in Various Anchor Locations | Yun-Seok Kang, PhD, Injury Biomechanics Research  
*CoAuthors:* Rakshit Ramachandra, Aditya Belwadi, Matthew Maltese, John Bolte, and Jordan Majstorovic |                                                                                                              |
| 11:50 | A Pilot Study of Toddler Anthropometry and Posture in Child Restraint Systems | Monica Jones, PhD, University of Michigan Transportation Research Institute, Ann Arbor, MI.  
*CoAuthors:* Kathleen Klinich, Sheila Ebert-Hamilton, Laura Malik, Miriam Manary, and Matthew Reed |                                                                                                              |
| 10:00 | -BREAK - |                                                                                                  |                                                                                                              |
| 10:20 | Child Restraint System Attachment via Mechanical Advantage vs. LATCH: Differential Effects on Security and Accuracy of Installation | Jessica Mirman, PhD, Children’s Hospital of Philadelphia, PA.  
*CoAuthors:* Sara Seifert, Mark Zonfrillo, Dennis Durbin, and Kristy Arbogast |                                                                                                              |
| 10:40 | The Global Diffusion of Child Restraint Laws: 40 Years of Policy Development | José Ignacio Nazif-Munoz, PhD Candidate, McGill University, Montreal, Canada. |                                                                                                              |
| 11:00 | Reasons for Child Passenger Non-Restraint in Motor Vehicles | Mark R. Zonfrillo, MD, Children’s Hospital of Philadelphia, PA.  
*CoAuthors:* Rennie Ferguson and Lorrie Walker |                                                                                                              |
| 11:20 | Occupant Protection for Low Birth-Weight Babies | Julie Brown, PhD, Neura Injury Prevention Research, Randwick, Australia.  
*CoAuthors:* Aileen Chua, John Sinn, and Elizabeth Clarke |                                                                                                              |
| 12:00 | -LUNCH - |                                                                                                  |                                                                                                              |
### YOUNG DRIVERS AND PEDESTRIANS  
**Moderator:** Allison Curry, PhD

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| 1:10  | Teen Drivers’ Perceptions of Inattention and Mobile Device Use While Driving | Catherine C. McDonald, PhD, University of Pennsylvania School of Nursing, Philadelphia, PA.  
*CoAuthor:* Marilyn Sommers |                                                                                                              |
| 1:30  | Effects of Dram Shop, Responsible Beverage Service Training, and State Alcohol Control Laws on Underage Drinking Driver Fatal Crash Rates | Michael Scherer, PhD, Pacific Institute for Research and Evaluation, Calverton, MD.  
*CoAuthor:* James Fell |                                                                                                              |
| 1:50  | An Analysis of Young Driver Crash Types and the Associated Economic Lifetime Car Cost in Victoria, Australia | Samantha Collins, PhD Candidate, Monash University Accident Research Centre, Melbourne, Australia.  
*CoAuthors:* Michael Fitzharris and Mike Lenne |                                                                                                              |
| 2:10  | Autism, Training and Driving: Predicting Future Licensure Success | Timothy I. Brown, PhD, National Advanced Driving Simulator, The University of Iowa, Iowa City, IA.  
*CoAuthors:* Daniel Cox, Gary Gaffney, Rose Schmitt, Ron Reeve, and Matthew Moncrief |                                                                                                              |
Monday (continued)

October 5

2:15 A Finite Element Model of a 6-Year-Old Child for Simulating Pedestrian Impacts
Costin Untaroiu, PhD, Virginia Tech, Blacksburg, VA.  
CoAuthors: Schap and Gayzik

2:20 Pediatric Pedestrian Motor-Vehicle Accidents in Delaware Between 2002 and 2012
Alfred Atanda, Jr, MD, Alfred I. DuPont Hospital for Children, Wilmington, DE.  
CoAuthor: Ravi Talati and Tim Niller

FRONTAL CRASH PROTECTION  
Moderator: Damien Subit, PhD

2:25 The Potential Benefits of Smart Load Limiters in Frontal Impacts
Karthikeyan Ekambaram, PhD Candidate, Design School, Loughborough University, Loughborough, United Kingdom.  
CoAuthor: Richard Frampton

2:45 The Contribution of Pre-Impact Posture on Restrained Occupant Finite Element Model Response in Frontal Impact
David Poulard, PhD, Center for Applied Biomechanics, University of Virginia, Charlottesville, VA.  
CoAuthors: Richard Kent, Bingbing Nie, John-Paul Donlon, and Damien Subit

3:05 Improved Survival Model for Foot/Ankle/Leg High Rate Axial Impact Injury Data
Ann Bailey, PhD candidate at the Center for Applied Biomechanics, University of Virginia, Charlottesville, VA.  
CoAuthors: Timothy McMurry, Gerald Poplin, Robert Salzar, and Jeff Crandall

3:25 BREAK

3:45 Incidence and Injury Outcome in Crashes with Guardrail End Terminals
Nicholas Johnson, PhD, Virginia Tech Center for Injury Biomechanics, Blacksburg, VA.  
CoAuthor: H. Clay Gabler

4:05 Comparison of Expected Crash and Injury Reduction from Production Forward Collision and Lane Departure Warning Systems
Kristofer D. Kusano, PhD, Virginia Tech, Blacksburg, VA.  
CoAuthors: John Scanlon, Thomas Gorman, and H. Clay Gabler

4:25 Real-World Rib Fracture Patterns in Frontal Crashes in Different Restraint Conditions
Ellen Lee, MS, National Highway Traffic Safety Administration, Washington, DC.  
CoAuthors: Mark Scarboro and Matthew Craig

4:45 Driver Injury Risk Variability in Finite Element Reconstructions of CIREN Motor Vehicle Crashes
James P. Gaewsky, MS, Wake Forest University, Center for Injury Biomechanics, Winston-Salem, NC.  
CoAuthors: Ashley Weaver, B. Koya, and Joel Stitzel

5:05 ATD Spine Response as a Function of Crash Pulse Input
Hans Hauschild, MS, Medical College of Wisconsin, Milwaukee, WI.  
CoAuthors: Frank Pintar and Dale Halloway

5:15 Parametric Study of Lower Spine Loads with Varying Pulse and Seat Pan Angles Using Validated GHBMC
Mike W. J. Arun, PhD, Medical College of Wisconsin, Milwaukee, Wisconsin

- ADJOURN -
Tuesday
October 6

8:00 GET ACQUAINTED BREAKFAST
NEW members and prospective members welcome. Meet colleagues and learn more about joining AAAM

EPIDEMOLOGY AND POLICY
Moderator: Jamie Dow, MD

9:00 Vehicle-Based Crash Severity Metrics: Is There an Alternative to Delta-V?
Ada Tsoi, Virginia Tech, Blacksburg, VA. CoAuthors: H. Clay Gabler

9:20 Implications of Functional Capacity Loss and Fatality for Vehicle Safety Prioritization
Timothy L. McMurry, PhD, Public Health Sciences, University of Virginia, Charlottesville, VA. CoAuthors: C. Sherwood, Gerald Poplin, Maria Segui-Gomez, and Jeff Crandall

10:00 Association Between NCAP Ratings and Real-World Rear Seat Occupant Risk of Injury
Kristina Metzger, PhD, Center for Injury Research and Prevention, University of Philadelphia, Philadelphia, PA. CoAuthors: Siobhan Gruschow, Dennis Durbin, and Allison Curry

10:20 Increasing Prevalence of Obese Drivers in US Might Have Implications for Road Traffic Injury Prevention and Control
Junaid Bhatti, PhD, Sunnybrook Health Sciences Centre Research Institute, Toronto, Canada. CoAuthors: Avery Nathens and Donald Redelmeier

L Rachid Salmi, MD, PhD, University of Bordeaux, ISPED, Bordeaux, France.

10:30 BREAK

INJURIES TO ADULT OCCUPANTS
Moderator: Carl Soderstrom, MD

10:50 Bone Quality Measurement for Motor Vehicle Crash Occupants and Correlation with Age and Fracture Incidence
Ashley Weaver, PhD, Wake Forest University Center for Injury Biomechanics, Winston-Salem, NC. CoAuthors: R. Caressa Hightower, Sarah Lynch, Kristen Beavers, Anna Miller, and Joel Stitzel

11:10 Older Adults at Increased Risk as Pedestrians in Victoria, Australia: An Examination of Crash Characteristics and Injury Outcomes
Jennifer Oxley, PhD, Monash University Accident Research Centre, Melbourne, Australia. CoAuthors: Steve O’Hern and David Logan

11:30 Prevalence and Risk Factors of Aortic Injuries Due to Motor Vehicle Accidents: Secondary Data Analysis
Joshua A. Sznol, University of Miami, Miami, FL. CoAuthors: Tulay Koru-Sengul, George Bahouth, Denis Murakhovsky, and Carl Schulman

11:40 Biofidelity Corridors for Sternum Kinematics in Low-Speed Side Impacts
Damien Subit, PhD, University of Virginia, Charlottesville, VA and Arts et Métiers ParisTech, Paris, France. CoAuthors: Felix Möhler, and Bengt Pipkorn

12:00 -LUNCH -

12:20 Analysis of First Rib Fractures in Motor Vehicle Collisions: No Longer Hallmark of Severe Trauma?
Thomas Hartka, MD, University of Virginia, Charlottesville, VA. CoAuthors: Gerald Poplin, Tim McMurray, and Mark Sochor

10:30 An Unusual Pattern of Spinal Injuries Among Surviving Passengers in a Commercial Airplane Crash: Implications for Understanding Injury Etiology
Mary Pat McKay, MD, National Traffic Safety Board, Washington, DC. CoAuthors: Kris Poland and Jason Fedok

DRIVER BEHAVIOR
Moderator: Richard Frampton, PhD

2:00 Driver Behavior During Overtaking Maneuvers from the 100-Car Naturalistic Driving Study
Rong Chen, MS, Virginia Tech, Blacksburg, VA. CoAuthors: Kristofer Kusano and H. Clay Gabler

2:20 Analysis of Driving Behavior Prior to Intersection Crashes Using EDRs
John M. Scanlon, MS, Virginia Tech, Blacksburg, VA. CoAuthors: Kristofer Kusano and H. Clay Gabler

3:00 AAAM General Membership Meeting
All AAAM members are encouraged to attend.

4:00 -ADJOURN -

6:30 -RECOGNITION DINNER -
The National Constitution Center (15 minute walk)
525 Arch Street, Philadelphia
Mortality Risk in Pediatric Motor Vehicle Crash Occupants: accounting for Development Stage and Challenging Abbreviated Injury Scale Metrics
Andrea Doud, MD, Wake Forest University, Winston-Salem, NC. CoAuthors: Ashley Weaver, Jennifer Talton, Ryan Barnard, Samantha Schoell, John Petty, and Joel Stitzel

The Development of AIS 2015
Mark Scarboro, National Highway Traffic Safety Administration, Washington, DC. CoAuthors: Janet Price and Patrick Gillich

Development and Evaluation of an Injury-Based Advanced Automatic Crash Notification Algorithm for Occupant Triage Recommendation
Joel Stitzel, PhD, Wake Forest University, Winston-Salem, NC. CoAuthors: Ashley Weaver, Ryan Barnard, Jennifer Talton, Samantha Schoell, Shayn Martin, and Wayne Meredith